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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Rustem Osmanow

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05/21/2004

Stallman & Pollock

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EXAMINER

MENEFEE, JAMES A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/858,147

Applicant(s)

OSMANOW ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-15,19-60 and 64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14,15,19-22,30-36 and 60 is/are allowed.
- 6) ☒ Claim(s) 1,5-13,23-29,37-59 and 64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20030116.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

The Office appreciates the efforts of reconstruction done by the Applicants and their representatives. The reconstruction materials were received 12/16/2003. This action is in response to the amendment filed 1/16/2003. Claims 1, 8, 10, 14, 30, 35-45, 47, 58-60, and 64 are amended, while claims 2-4, 16-18, 61-63, and 65-67 are cancelled. Claims 1, 5-15, 19-60, and 64 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 5-13, 37-47, and 58-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 8, and 10, each of these claims recites "a plurality of electrodes...connected to a discharge circuit." (emphasis added). In these claims the discharge circuit has already been recited. Thus, antecedent basis in the claims is not proper, as it is not clear whether Applicant is discussing the same discharge circuit or a new circuit. It appears that applicant is not discussing a new discharge circuit, so the term "a" should be replaced with "said." The remaining claims are rejected as depending on these claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakata et al. (previously cited US 5,305,338). Wakata discloses in Fig. 2 an excimer laser having a laser tube 5 filled with a laser gas and a known discharge circuit (Fig. 1) connected to a plurality of electrodes 9 for exciting the laser gas. There is inherently an optical resonator because this is necessarily a part of an excimer laser. The discharge circuit includes a solid-state switch 1 configured to switch a voltage needed to produce desired pulse energies.

Wakata does not explicitly disclose that there is an additional load between the discharge electrodes and the peaking capacitor, the additional load being a resistor. However, in Fig. 80, Wakata discloses on the three rightmost parallel branches a peaking capacitor C_p , the discharge electrodes, and a load resistor. In such parallel branches, it is known in the art that branches may be interchanged and one will arrive at the equivalent circuit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to interchange the branches of the discharge electrodes and the load resistor, since this configuration will be equivalent to the configuration of Fig. 80, and the selection of any of these known equivalents would be within the level of ordinary skill in the art.

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Claims 23-29, 48-49, 51-52, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakehata et al. (previously cited Appl. Phys. Lett., Dec. 1992) in view of Wakata. The claimed invention is taught as follows:

Regarding claims 23, 26, 48, and 51, Kakehata discloses a molecular fluorine laser system comprising a laser tube filled with gas, an optical resonator, a discharge circuit, and inherently a plurality of electrodes in the laser tube connected to the discharge circuit for exciting the laser gas. There is an oscillator discharge circuit and an amplifier discharge circuit, where a pulse applied to the amplifier is delayed from that applied to the oscillator discharge circuit. The output from the oscillator is directed into the tube of the amplifier at a same time as the discharge is applied to the amplifier, increasing the output of the laser to a desired level. There are switches connected to each of the discharge circuits. It is not disclosed that the switches may be solid state. Wakata teaches laser discharge circuits including solid state switches. It would have been obvious to one skilled in the art to replace the switches of Kakehata with Wakata's switch because this switch will not have the problems of instable discharge and temperature sensitivity, as taught by Wakata.

Regarding claims 24 and 27, due to the placement of the switch and discharge electrodes, the voltage across the switch is substantially the same as the voltage across the discharge electrodes of the oscillator laser, and is inherently less than required to produce a substantially similar level of output pulse energy without the amplifier.

Regarding claims 25 and 64 it is not disclosed that the switches comprise a plurality of IGBT's, more specifically a plurality of parallel combinations, with each combination including at least one IGBT. Wakata teaches such a switch in Fig. 3. It would have been obvious to one

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skilled in the art to replace the switch of Kakehata with Wakata's switch because this switch will not have the problems of instable discharge and temperature sensitivity, as taught by Wakata.

Regarding claim 28, the delay is controlled therefore the switches are synchronized.

Regarding claim 29, a trigger applied to the switches is delayed before the second switch.

Regarding claims 49 and 52, the electrical pulses will provide an output of the laser system at the desired energies, and there is no mention of a step-up transformer.

Claims 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakehata and Wakata as applied to claims 23-29, 48-49, 51-52, and 64 above, and further in view of Ershov et al. (previously cited US 5,970,082). Kakehata and Wakata teach all of the limitations of claims 23-29, 48-49, 51-52, and 64 as shown above, but do not teach that the resonator includes a line-narrowing module. Ershov teaches an excimer laser system in which the resonator includes a line narrowing module (col. 1 line 10 – col. 2 line 60). It would have been obvious to one skilled in the art to include a line narrowing module in the resonator because this will provide a laser beam having a narrow bandwidth, as taught by Ershov.

Claims 54-55, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakata in view of Gordon (previously cited US 5,815,386). Wakata discloses the limitations of these claims as shown in the rejection of claim 8 above, but does not disclose that there be the particular protective circuit parallel to the switch for protecting the switch, said protective circuit including a diode and a saturable inductor as claimed. Gordon teaches a circuit having an IGBT switch 34 and having a protective circuit in parallel with the switch, said protective circuit

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including a diode and saturable inductor (Fig. 2, 3a-c, col. 1 line 44 – col. 2 line 34). It would have been obvious to one skilled in the art to include such a protective circuit because these elements will protect the switch from voltage spikes, as taught by Gordon.

Claims 54 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakata in view of Church et al. (US 6,055,161). Wakata discloses the limitations of these claims as shown in the rejection of claim 8 above, but does not disclose that there be the particular protective circuit parallel to the switch for protecting the switch, said protective circuit including a resistor and capacitor in series as claimed. Church teaches a circuit having an IGBT switch 50 and having a protective circuit in parallel with the switch, said protective circuit including a resistor and a capacitor in series (see Fig. 1 and discussion thereof). It would have been obvious to one skilled in the art to include such a protective circuit because these elements will reduce the strain and voltage on the IGBT, as taught by Church.

Allowable Subject Matter

Claims 1, 5-7, 10-13, 37-47, and 58-59 would be allowable if “a” were changed to “said” as required by the rejections under 35 U.S.C. 112 set forth in this Office action.

Claims 14-15, 19-22, 30-36, and 60 are allowed.

Regarding independent claims 1, 14, 30, and 60, there is not taught or disclosed in the prior art an excimer or molecular fluorine laser including *inter alia* a discharge circuit for exciting the laser gas including a solid state switch, said switch comprising a plurality of IGBTs including a parallel combination, where at least one path of the parallel combination includes

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only a single IGBT. The previously cited Wakata reference discloses the above, except the parallel combination of IGBTs includes a large number of IGBTs in each parallel path. There is no suggestion to use only a single IGBT in any of the parallel paths.

Regarding independent claim 10, there is not taught or disclosed in the prior art an excimer or molecular fluorine laser including a solid state switch that has the particular features of the peaking and sustainer capacitors as claimed.

Response to Arguments

Applicant's arguments filed 1/16/2003 have been fully considered, and their persuasiveness discussed below.

Applicant's arguments concerning the amended claims including only a single IGBT in a parallel path (p. 6 and 8 of response, concerning current claims 1, 5-7, 11-15, 19-22, 30-47, and 58-60, 63, and 66-67) are persuasive.

Applicant's argument regarding claim 10 (p. 6) are persuasive.

Applicant's arguments regarding the additional load (p. 7, concerning claims 8-9) are not persuasive. Upon further consideration of Wakata, it is deemed that Wakata teaches the limitations; see the rejection of claims 8-9 above.

Applicant's arguments regarding Gordon being nonanalogous art (p. 7) are not persuasive. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. *See In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the

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claims regarding the protective circuits are concerned with the problem of an IGBT being harmed by excessive currents in the system. One skilled in the art would not look merely to laser discharge circuits to address problems with IGBTs, but would look to other circuits including IGBTs to see which problems, and solutions to those problems, may come up with IGBT circuits. Gordon is drawn to the protection of IGBTs in a circuit, and thus the reference is reasonably pertinent to this particular problem. Note that the same argument may be made regarding the newly cited reference to Church.

Applicant's arguments concerning the Basting and Desor references being barred as prior art under 35 U.S.C. § 103(c) (p. 8-9) are persuasive. However, the Examiner believes that the Basting reference was erroneously used in the prior rejection; Basting was not required because Kakehata was cited to disclose the limitations. A new rejection is made above without the Basting reference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JM
April 1, 2004



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